gramme, UNESCO's 'Biosphere Conference' and subsequently Man and the Biosphere (MAB) Programme, and the 1972 U.N. Conference on the Human Environment. This last conceived the United Nations Environment Programme (UNEP), which was the first intergovernmental organization with the environment as its sole but giant responsibility. The creation of UNEP by the U.N. General Assembly in December 1972 was a culmination of a long succession of earlier steps by conservation organizations and dedicated conservationists who had for decades worked hard with little public encouragement.

The paper reviews the present set-up of governmental and non-governmental conservation organizations at global and regional levels. Several national and private organizations are also making important contributions to international conservation through projects and publications. All these organizations cooperate in a synchronized manner. The field of conservation of Nature is so wide and variable, and there is so much to do, that each of these organizations has its particular role—its own niche.

Despite all these efforts, there are today more productive water and land areas being destroyed than are being preserved and restored. Does this failure mean that the present conservation organizations are inefficient? The Author does not think so, because the environmental problems are immense and often on a global scale. On the other hand, the conservation movement is not yet fully mature. It grows, but is continuously being overtaken by environmental destruction through over-utilization of renewable natural resources primarily owing to over-population in tropical and subtropical areas. This calamity must ultimately be countered by suitable education but meanwhile be warded off by technical assistance schemes which have to be restructured and designed on sound ecological principles. UNEP is working for such a policy, which was adopted by the U.S. government in 1977. In this way conservation will be an integral part of development.

A World Conservation Strategy is at present in preparation by IUCN with the cooperation of other international bodies. In the Author's opinion a necessary first step of such a strategy must be a global campaign for conservation education as a basis for environmental understanding at all social levels and age-classes.

Environmental Conservation: How to Contribute

In Nature, all forms of life are dependent on one another. Man is only one among millions of species and must cease to consider the rest of creation as freely available for his own purposes. Being alone in his capacity to affect the biosphere consciously, it is essential that he should set himself guidelines in so doing—especially now that his behaviour is clearly seen to be leading to early catastrophe. These guidelines can be consistent with the general desire to see living conditions improve.

Population:—As long as Man retains his ability to dispose of his natural enemies and thereby to escape from the checks provided by Nature whenever a species tends to proliferate unduly, one of the greatest threats to the biosphere will be from his numbers. Their increase is mainly due to success in fighting disease and infant mortality; but even though this success had its origin in the industrialized world, the population explosion is now largely confined to the Third World, and there is little we can do beyond supporting whenever possible the idea of voluntary, government-sponsored, family planning schemes.

Deforestation:—A danger on which great stress should be laid comes from the destruction of trees and especially of the tropical rain-forests on which the world depends to a substantial degree for the maintenance of a healthy atmosphere. Again we of the industrialized countries can do little to arrest a process which is taking place in distant lands, but we must at least make up for some of the loss through planting at home. Those without a garden must look for ways of aiding the cause of tree-planting and help to fight the destruction of trees. Recycling of paper and economy in its use can help in this.

Energy:—This problem is intimately linked to that of increasing air pollution; for combustion pollutes—even that of wood. As the bulk of the energy we use results from burning coal, oil, or gas—all of them polluting and irreplaceable— nuclear power may well remain the best resource, and it is everyone's duty to form a dispassionate judgement on its development and use, bearing in mind that the main alternative to nuclear power is greater pollution—unless we are prepared to accept all-around curtailment of energy consumption, which is a prospect that should also be considered with all its implications. (I discount as being unlikely to be developed in time on a sufficient scale the use of solar, geothermal, marithermal, and other possibilities.)

Meanwhile, in order to limit the fouling of the atmosphere and the rate at which the world's resources are being used up, it is suggested:

1. To refrain from driving your car above 80/90 km per hour when the consumption of most engines increases substantially.
2. To give preference to train or bus, especially when travelling alone.
3. To choose amusements that are not unnecessarily energy-consuming. Experience had taught Voltaire's hero that the wise man 'cultivates his garden'. If you spend your leisure time at home and tending your garden, you will be doing no harm; in fact, you may be benefiting the biosphere.
4. Walking is a very healthy exercise, probably the best of all after middle age. Every opportunity which comes your way to walk instead of drive should be taken advantage of.
5. In summer 20 degrees centigrade is considered an agreeable temperature. Why insist on having more in winter? The habit of heating premises to a higher temperature is in any case a recent one.

Waste:—Avoid wasting. Using paper means using trees; using plastic mostly means using oil. All garbage that is liable to decay should somehow be returned to the Earth.

Use whatever means you know of for making discarded metal or glass available for recycling.

Diet:—Most people overeat. American doctors have said that obesity is a greater health hazard than either cancer or polio. While keeping a balanced diet, hold the proportion of meat down to a minimum. The use of land for raising cattle is very wasteful; the same land will yield several times as much food if used for growing potatoes, and land is one of the most drastically limiting factors.

Chemicals:—It is the law of Nature to fight your enemies and try to hold them down; most of the time, killing is necessary for survival. However, in our present state of ignorance it is a short-sighted policy to aim at extermination of any species on the mere argument that it does harm to Man. Restraint should be exercised in the use of insecticides, pesticides, and weed-killers, as well as of detergents and artificial manures. Only experience can tell, and often only in the long run, what damage results to the biosphere from the use of such products.

To follow these guidelines involves no real sacrifice. There is still plenty of scope for improving the quality of life. Boundless possibilities can be derived from science and medicine to improve Man's capacity to lead a full and enjoyable life, from technology to free him from drudgery, and from education to raise the quality of his recreations.

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Eradication or Utilization?

Science and technology have provided us with a whole battery of methods that are able to help reduce the economic losses resulting from the growth of weeds. Most of these techniques consume resources (including energy resources) at a great rate (Odum, 1971), and one cannot help wondering whether a better way to deal with the weed problem might not be utilization rather than attempted eradication. After all, if a particular weed is so abundant that large amounts of money are spent in trying to reduce its population level, then it is probably common, aggressive, and present in sufficient amounts for harvesting. The need for weed control might be greatly reduced if only a fraction of the resources that are currently spent on control programmes were to be diverted to weed utilization. These thoughts are prompted by the realization that many of the common, and especially the perennial, weed species of Britain were formerly considered to be biological resources of some value, and were actively cultivated (Rymer, 1976).

There are many reasons for weed control, and these sorts of considerations are obviously not of general applicability. For example, aggressive weeds destroying native plant communities have to be destroyed if the native vegetation is to be conserved (Heddle, 1974). However, in some particular situations, as in third-world countries with a large agricultural labour force and only limited economic resources available for the mechanical and chemical control of weeds, the possibility of setting up small, local industries based on abundant plant resources that are not at present utilized commercially may be a real possibility. Even in developed countries the 'back to earth' movement may open up the possibility of using (and hence controlling) some common plants that are now thought of as weeds. Ancient rights might be revived, such as the right to cut Bracken (*Pteridium aquilinum*) or Gorse (*Ulex europaeus*), e.g. for burning to bake bricks and produce a useful potash fertilizer or ingredient of soap (Rymer, in press).

As well as providing a new (or reviving a forgotten) resource, the sale of such privileges and rights on land that was already being used as pasture might help in weed control and would most certainly act as a form of environmental education, emphasizing our ultimate dependence on the Earth. This latter point is not unimportant: I am reminded of an American friend, not environmentally unaware, who has the reputation of cooking excellent pumpkin pie. When she visited England I presented her with a pumpkin, but found that this put her at a complete loss: her pumpkins had always arrived in cans!

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Postgraduate Course on Environmental Science and Technology

Biologists and chemists play an important role in environmental control because parameters, by which ecosystems are described and their disturbances often measured, are predominantly chemical or biological in nature; the same applies to preventive and curative technologies. Similarly, professionals in these disciplines are heavily involved in resource management and in the development of new technologies.

As most university curricula do not provide opportunities for comprehensive environmental studies, it has been felt that a special postgraduate course could be valuable in equipping and meeting the demand for environmental experts capable of practical interdisciplinary work. Therefore, the International Institute for Hydraulic and Environmental Engineering, Delft, The Netherlands, will organize again for this coming year a postgraduate course on Environmental Science and Technology.

This course, which will be given in English, is practically booked up for the coming academic year but will commence again on 15 October 1979, and last until 8 September 1980. Biologists, chemists, chemical engineers, and other university graduates with at least 3 years' experience of environmental matters, may apply for participation. The course programme involves lectures, design studies, laboratory work, and fields measurements. A prospectus containing more information can be obtained on request from the Institute, and indicates how financial assistance to cover the cost of attending the course may be sought.

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